# COLUMBIA UNIVERSITY
## School of Professional Studies

## MS Applied Analytics, Fall 2019

<u>Module:</u>   APAN 5100, Applied Analytics in the Organizational Context
<u>Professor:</u>  Prof. Lori Cenci
<u>TA:</u>        Kevin O'Brien

<u>Assignment 2:</u>   Marketing Analysis
<u>Due date:</u>        12th Oct, 2019

**Submission By:**
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   <u>Email:</u> harsh.dhanuka@columbia.edu

**To:**     George Batton, Chief Financial Officer, FreshDirect LLC

**From:**   Harsh Dhanuka, Junior Analyst, FreshDirect LLC

**Re:**     Customer Segmentation Analysis and Target Recommendations

**Date:**   11th October 2019


For our new marketing activity, I have scrutinized our historical data and curated a concise analysis *(Appendix 1)* as to our current standing, and how to approach the new campaign which can especially help boost sales. There are numerous approaches to segmentation, which include: geographic, demographic, cultural, behavioral, usage rates and psychographics. The bottom-line for my suggestions would be based on the **Pareto Principle** *(supported with appropriate justification)*, which states that 80% of the revenues are given by 20% of our clients.[1]

Analysis reveals that the residents of **Manhattan and Brooklyn** contribute to almost 95% of our total sales every year *(Appendix II)*, and have shown a $1.2 million increase over the previous year, while all other 8 areas combined only grew by $0.19 million *(Appendix III)*, so our core segmentation would focus on those two areas. They also have the highest count of our regular or loyal shoppers: weekly, bi-weekly, and every three week *(Appendix IV)*. These regular shoppers will form a base for word-of-mouth publicity and positive reviews to potential customers. It is also safe to assume that we have a good market presence in these areas, owing to our prolonged 16-year old establishment.

**<u>Segments to Target[2]:</u>**

**Target 1:** Both males and females of any age, with income of above $97,000 a year

**Target 2:** All millennials between the age group 22 – 37 years


**Rationale:**

So far, we have been describing our best customers to be 76% female, and who have an income of above $125,000 per year. My analysis reveals that the income bracket for our best customers should be way below, **starting at $97,000** per year *(Appendix V),* and should include **both genders**. It is seen that most of the high-income earners belong to the Manhattan and Brooklyn areas, who intuitively give us the highest sales every year.

It was found that 69% of our current customers are female *(Appendix VI)*, implicating a need to increase our male targets. External research[3] has suggested that in 2019, over 60% millennials in the US have opted for online purchases, up from 47% in the previous year. There is an opportunity here to tap these people, including both male and female, as long as their income level is **above $40,000** a year. The age group can extend to 52 years but I recommend 37 *(Appendix VII)*.

The **age group 22-32** witnessed a tremendous 82% total sales growth rate over the previous year, and the group 32-42 saw a 34% increase *(Appendix VIII)*. These figures align perfectly with my external research and as long as these figures show an upward trend, they should be the core focus of any marketing activity we undertake whilst also taking care of reducing heavy expense.
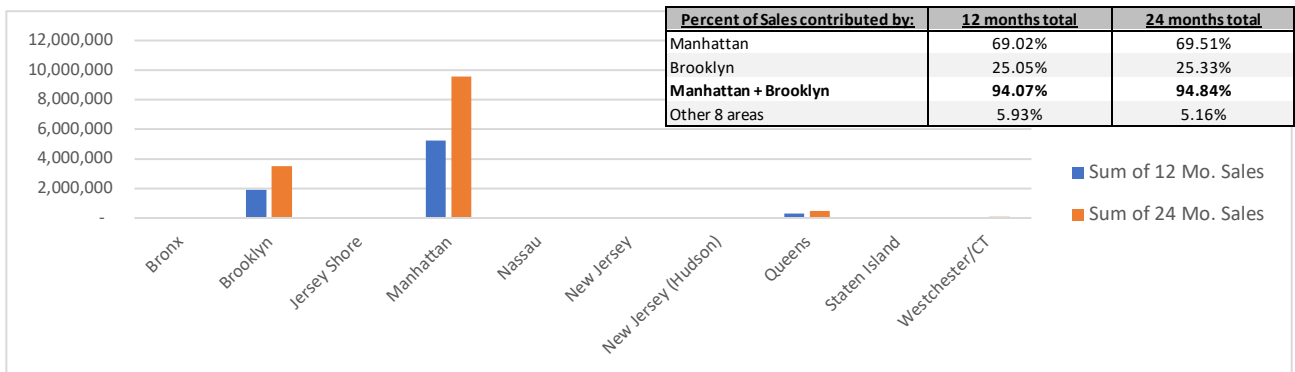
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[1] https://marketinginsidergroup.com/strategy/marketing-80-20-rule-take-advantage/
[2] Limited to those residing in Manhattan or Brooklyn only.
[3] https://www.digitalcommerce360.com/2019/03/26/millennials-online-shopping/

**Appendix I:** Holistic view of the loyalty segments by geographic areas, whilst also factoring in the sum of incomes of the members belonging to each group; the size of the cell blocks represents average age of the customers.
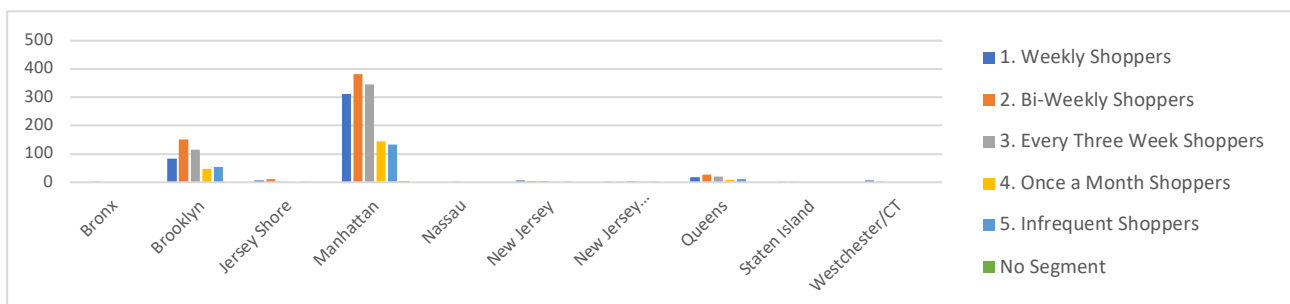


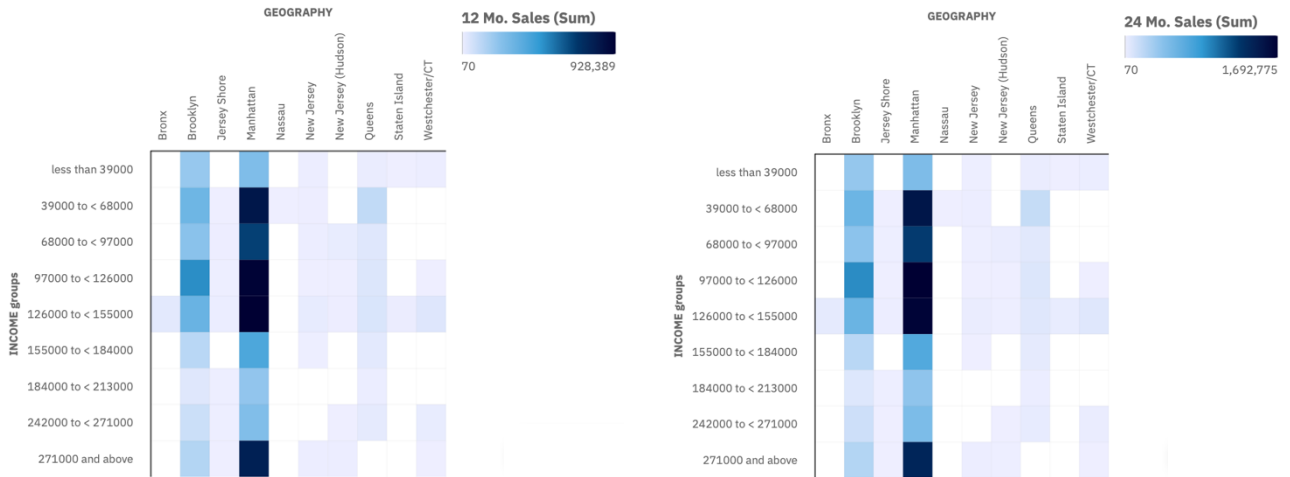**Appendix II:** Sales totals for 12 and 24 months, sorted by geographic area.



| Percent of Sales contributed by: | 12 months total | 24 months total |
|---|---|---|
| Manhattan | 69.02% | 69.51% |
| Brooklyn | 25.05% | 25.33% |
| **Manhattan + Brooklyn** | **94.07%** | **94.84%** |
| Other 8 areas | 5.93% | 5.16% |

**Appendix III:** Total sales growth over the past 2 years, for Brooklyn and Manhattan, and other areas.

| Total Sales by Area | Year 2 | Year 1 | Sales Growth |
|---|---|---|---|
| Manhattan | $ 5,242,678 | $ 4,316,590 | $ 926,088 |
| Brooklyn | $ 1,902,612 | $ 1,580,095 | $ 322,517 |
| **Manhattan + Brooklyn** | **$ 7,145,290** | **$ 5,896,685** | **$ 1,248,605** |
| Other 8 areas | $ 450,773 | $ 258,679 | $ 192,094 |

**Appendix IV:** Distribution count of regular shoppers based on loyalty, over the geographical areas.

**Appendix V:** Distribution of income over the geographical areas, whilst also factoring in the 12 and 24 month sales totals for each of the individual groups.
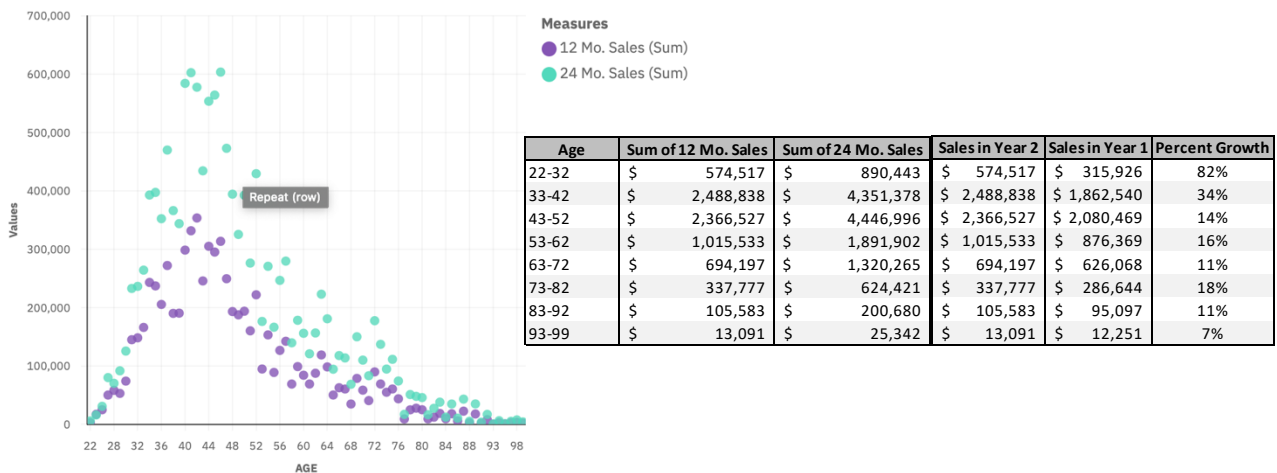


**Appendix VI:** Distribution of total sales by gender, for 12 and 24 months

| Gender | Percent of total 12 month Sales | Percent of total 24 month Sales |
|--------|---------------------------------|---------------------------------|
| Male | 31% | 31% |
| Female | 69% | 69% |

**Appendix VII:** Distribution of total sales for 24 months, based on age and income.
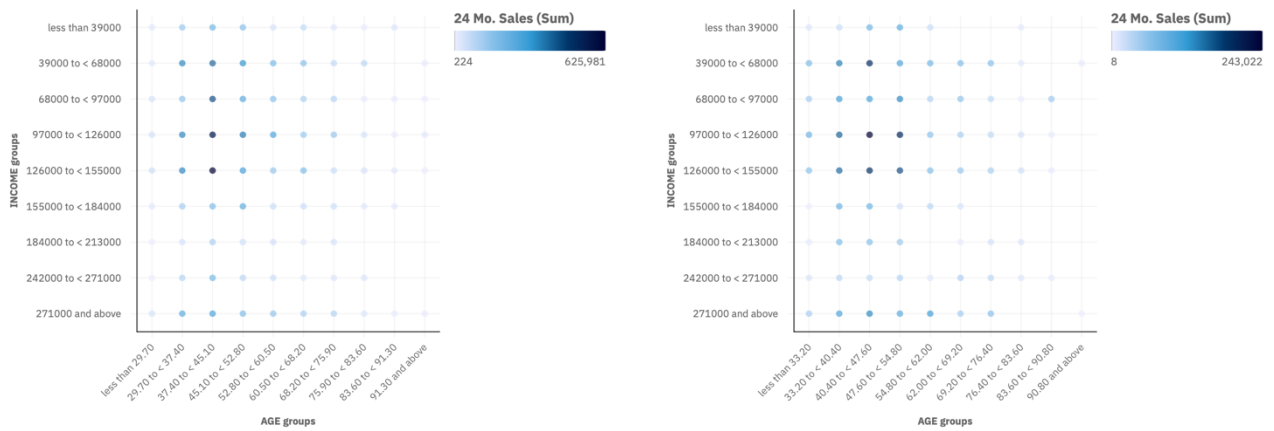


**Appendix VIII:** Distribution of total sales for 12 and 24 months, based on age; calculation of YOY growth.



**Measures**
- 12 Mo. Sales (Sum)
- 24 Mo. Sales (Sum)

| Age | Sum of 12 Mo. Sales | Sum of 24 Mo. Sales | Sales in Year 2 | Sales in Year 1 | Percent Growth |
|-----|--------------------|--------------------|-----------------|-----------------|----------------|
| 22-32 | $ 574,517 | $ 890,443 | $ 574,517 | $ 315,926 | 82% |
| 33-42 | $ 2,488,838 | $ 4,351,378 | $ 2,488,838 | $ 1,862,540 | 34% |
| 43-52 | $ 2,366,527 | $ 4,446,996 | $ 2,366,527 | $ 2,080,469 | 14% |
| 53-62 | $ 1,015,533 | $ 1,891,902 | $ 1,015,533 | $ 876,369 | 16% |
| 63-72 | $ 694,197 | $ 1,320,265 | $ 694,197 | $ 626,068 | 11% |
| 73-82 | $ 337,777 | $ 624,421 | $ 337,777 | $ 286,644 | 18% |
| 83-92 | $ 105,583 | $ 200,680 | $ 105,583 | $ 95,097 | 11% |
| 93-99 | $ 13,091 | $ 25,342 | $ 13,091 | $ 12,251 | 7% |

**To:**     Timothy Knoll, Chief Operating Officer, FreshDirect LLC

**From:**   Harsh Dhanuka, Junior Analyst, FreshDirect LLC

**Subject:** Geographical Segmentation and Heat Map Analysis

**Date:**   11th October 2019

From within our current delivery map, **Manhattan and Brooklyn** are the most attractive, as they earn the highest revenues, and also the maximum number of orders placed are from these two areas. Manhattan alone accounts for 69% of the total orders placed within the last 12 months, and Brooklyn 22%. The remaining 8 areas only make up 9% *(Appendix I)*. Also, Manhattan contributes to 70% of our total sales, while Brooklyn 25%, and the remaining 8 areas only make up 5% *(Appendix II)*. Further, Manhattan has seen a 58% growth on the total number of orders placed compared to last year, while Brooklyn saw a growth of 48% *(Appendix III)*, which definitely makes these two markets highly effective in terms of delivery optimization. I predict these trends will continue in future.

From within these two markets, certain unique zip codes have been identified, in which a majority of our customers reside and which provided **24-month sales of over $250,000** each. We need to target these specific codes, and collate delivery activities *(Appendix IV)*:

**Manhattan:**
Highest sales zip code: **10021**,     Sales (24 months) = $775,403
Other zip codes:        **10028, 10023, 10024, 10025, 10128, 10065, 10003, 10011, 10016, 10013, 10075 and 10014**

**Brooklyn:**
Highest sales zip code: **11215**,     Sales (24 months) = $842,942
Other zip codes:        **11201, 11238 and 11218**

There are 13 from Manhattan and 4 from Brooklyn. These **17 zip codes** in total provided for 62% or $8.5 million of the total sales for the last 24 months, whilst the remaining 105 of our delivery zip codes (from Manhattan and Brooklyn) provided for only 38% or $5.2 million.

From our total service array, the highest count of zip codes served are in Manhattan and Brooklyn, followed by Queens and New Jersey *(Appendix V)*. A **heat map** of our total 122 zip codes, and also the targeted 17 zip codes (in Manhattan and Brooklyn) has been put up in the notes *(Appendix VI)*. The **suggested route map** would be to focus first on Uptown Manhattan: The Upper East Side and the Upper West Side, which constitute the strongest zones and drive most of the sales. Then we should move on to Brooklyn, and then Lower Manhattan. Although Brooklyn gave us the maximum sales, but the cluster is small in purview of delivery optimization. I am certain my suggested route will help reap the maximum benefits; they are already well-served which makes optimized expansion easy.

It is seen that over the last 24 months, the **total per day average** orders for Manhattan area was 194, and for Brooklyn was 66 *(Appendix VII)*. Now, to further optimize logistics and increase efficiency, we can use the **day-wise delivery optimization** to understand which days we might need more personnel and vice-versa. My analysis of average per day orders reveals that most of our orders occur towards the beginning and the end of every week *(Appendix VIII)*. Inferably, there is a need to significantly reduce our manpower for Tuesdays through Thursdays. These can reduce costs largely in the long run.

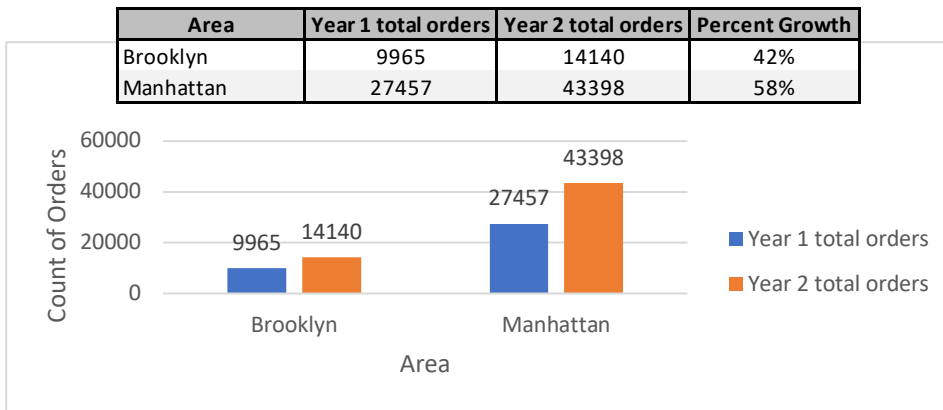**Core Focus: 17 zip codes within Manhattan and Brooklyn, Friday through Monday.**

**Appendix I:** Total orders placed from Manhattan and Brooklyn, and other areas in the last 12 months.

| Area | 12 Mo. Total orders | Percent of total |
|---|---|---|
| Brooklyn | 14140 | 22% |
| Manhattan | 43398 | 69% |
| **Total for above** | **57538** | **91%** |
| **Total for other areas** | **5382** | **9%** |

**Appendix II:** Total sales received from Manhattan and Brooklyn, and other areas in the last 12 and 24 months.

| Percent of Sales contributed by: | 12 months total | 24 months total |
|---|---|---|
| Manhattan | 69.02% | 69.51% |
| Brooklyn | 25.05% | 25.33% |
| **Manhattan + Brooklyn** | **94.07%** | **94.84%** |
| Other 8 areas | 5.93% | 5.16% |

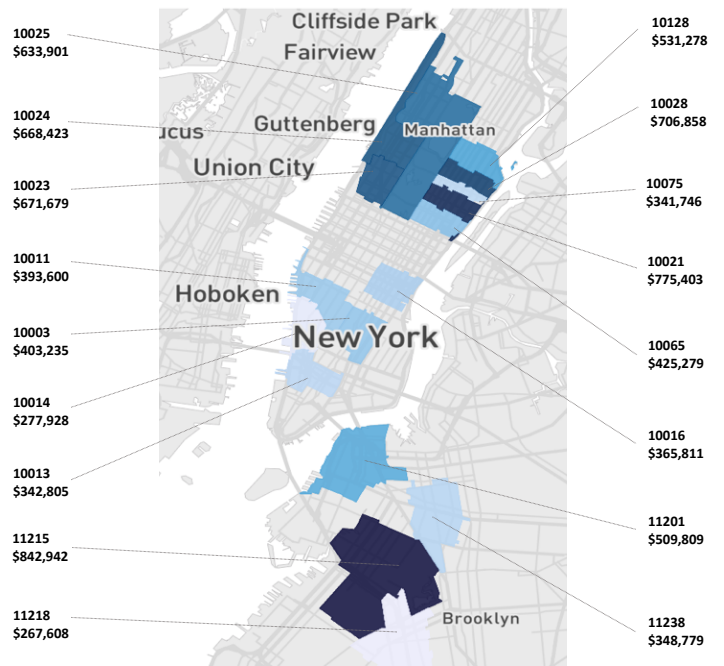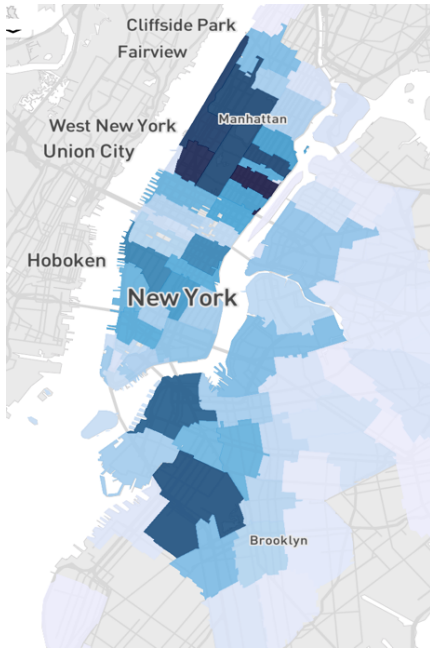**Appendix III:** Year on Year order growth rate for total orders from Manhattan and Brooklyn.

| Area | Year 1 total orders | Year 2 total orders | Percent Growth |
|---|---|---|---|
| Brooklyn | 9965 | 14140 | 42% |
| Manhattan | 27457 | 43398 | 58% |



**Appendix IV:** Zip codes to be targeted in Manhattan and Brooklyn

| Zip Codes | Sum of 24 Mo. Sales | Area |
|---|---|---|
| 11215 | $ 842,942 | Brooklyn |
| 10021 | $ 775,403 | Manhattan |
| 10028 | $ 706,858 | Manhattan |
| 10023 | $ 671,679 | Manhattan |
| 10024 | $ 668,423 | Manhattan |
| 10025 | $ 633,901 | Manhattan |
| 10128 | $ 531,278 | Manhattan |
| 11201 | $ 509,809 | Brooklyn |
| 10065 | $ 425,279 | Manhattan |
| 10003 | $ 403,235 | Manhattan |
| 10011 | $ 393,600 | Manhattan |
| 10016 | $ 365,811 | Manhattan |
| 11238 | $ 348,779 | Brooklyn |
| 10013 | $ 342,805 | Manhattan |
| 10075 | $ 341,746 | Manhattan |
| 10014 | $ 277,928 | Manhattan |
| 11218 | $ 267,608 | Brooklyn |
| **Total for the above** | **$ 8,507,084** | **62%** |
| **Total for other 8 areas** | **$ 5,244,343** | **38%** |

**Appendix V:** Cluster of total zip codes served
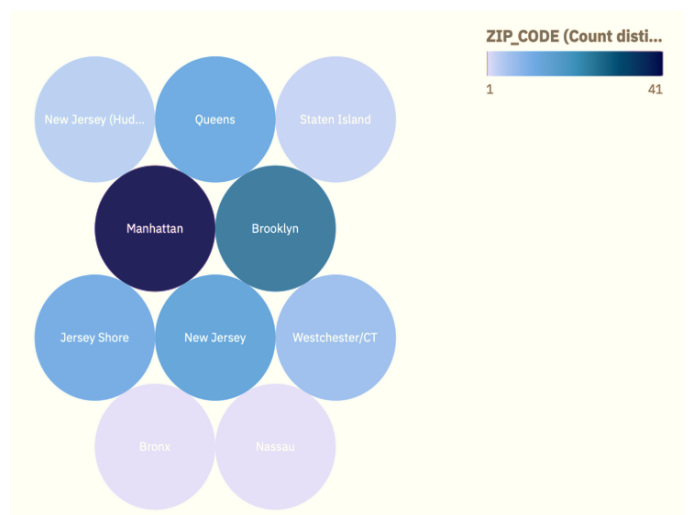
**Appendix VI:** Heat map of entire delivery array vs the suggested 17 target zip codes (Manhattan and Brooklyn).



| | |
|---|---|
| 10025 $633,901 | 10128 $531,278 |
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| 10013 $342,805 | 11201 $509,809 |
| 11215 $842,942 | 11238 $348,779 |
| 11218 $267,608 | |

*(Maps not to scale, illustrative only)*

**Appendix VII:** Total orders per day average for Manhattan and Brooklyn
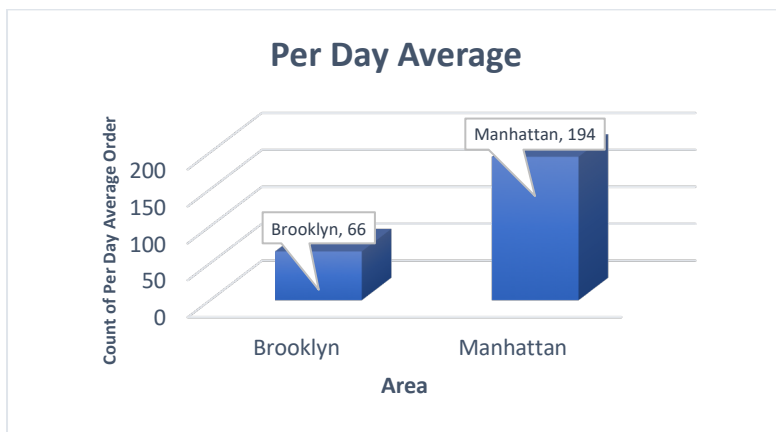


**Appendix VIII:** Day-wise total order schedule for Manhattan and Brooklyn, considering the last 12 months.
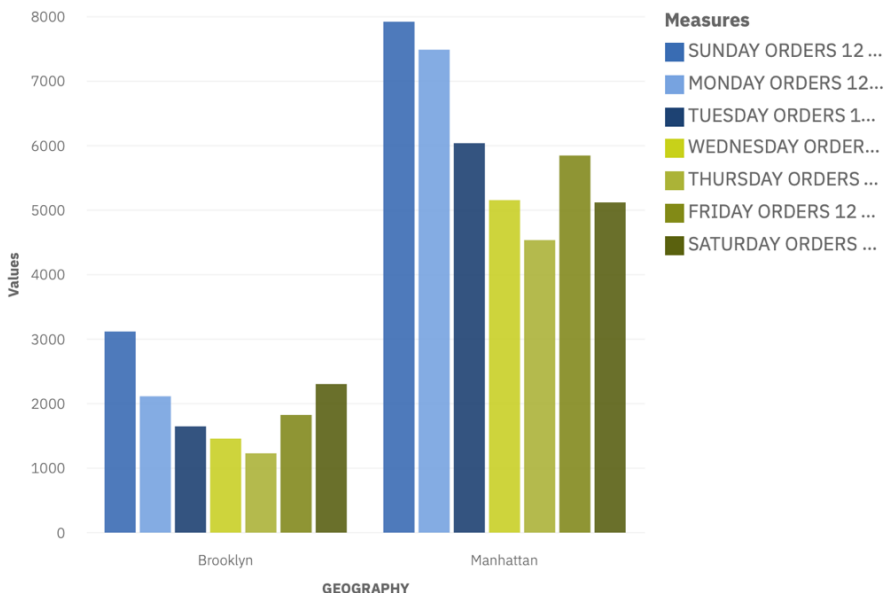
**To:**      David Mclnerney, Chief Executive Officer, FreshDirect LLC

**From:**    Harsh Dhanuka, Junior Analyst, FreshDirect LLC

**Subject:** Summary of customer segmentation and geographical optimization

**Date:**    11th October 2019

My analytics activity was conducted to comprehend two important tasks:

1.      For **Mr. Batton, CFO:** What customer segments need to be targeted for marketing, which can help boost sales.
2.      For **Mr. Timothy, COO**: Understand how our customers are spread across geographies, and which areas need to be targeted for delivery optimization and collation.

## Customer Segmentation Analysis:

Our best customers have been identified at **Manhattan and Brooklyn**, as they contribute to almost 95% of our total sales every year *(Appendix I)*. Further, these two areas have the highest count of our loyal shoppers *(Appendix II)*.

**Recommended Segments to Target** *(within Manhattan and Brooklyn)*:

**Target 1:** Both males and females of any age, with income of above $97,000 a year
**Target 2:** All millennials between the age group 22 – 37 years

Scrutiny reveals that the income range for our best customers should **start at $97,000** per year *(unlike current $125,000)* and include both genders *(Appendix III)*. External research[4] suggested that in 2019, over 60% millennials in the US have opted for online purchases, and I recommend to tap these people, including both male and female, whose income levels are **above $40,000** a year. There is an opportunity to stretch the age group to 52, but I recommend 37 *(Appendix IV)*. Also, the **age group 22-32** witnessed a tremendous 82% sales growth rate over the previous year, and the group 32-42 saw a 34% increase *(Appendix V)*, which all support the previously stated target segments.

## Geographical Optimization Analysis:

From within our current delivery map, Manhattan alone accounts for 69% of the total orders placed within the last 12 months, and Brooklyn 22%. The remaining 8 areas only contribute 9% *(Appendix VI)*. Further, both these areas have seen a steep growth in total orders placed *(Appendix VII)*. Within these two markets, 17 zip codes have been identified, which provided **24-month sales of over $250,000** each *(Appendix VIII)*:

**Manhattan:** **10021** *(Sales for 24 months = $775,403)*, **10028, 10023, 10024, 10025, 10128, 10065, 10003, 10011, 10016, 10013, 10075 and 10014**
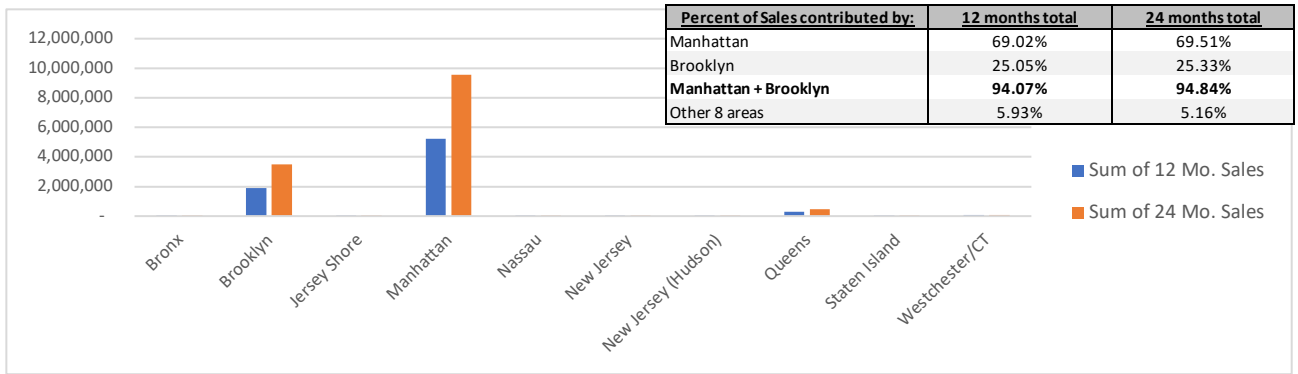**Brooklyn:**   **11215** *(Sales for 24 months = $842,942)*, **11201, 11238 and 11218**

Of our total 122 zip codes (Manhattan and Brooklyn), these **17** provided for 62% or $8.5 million of the sales for the last 24 months. A **heat map** of our delivery service (Manhattan and Brooklyn), and the targeted 17 zip codes has been put up in the notes *(Appendix IX)*. The **suggested route map** would be to focus first on Uptown Manhattan, and then move on to Brooklyn, and then Lower Manhattan.

It is also seen that over the last 24 months, the **total per day average** orders for entire Manhattan area was 194, and 66 for Brooklyn *(Appendix X)*. I also recommend to use the **day-wise delivery optimization**; most of our orders take place Friday through Monday *(Appendix XI)*.

➔ Core Focus: **17 zip codes within Manhattan and Brooklyn, Friday through Monday.**

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## Appendix I: Sales totals for 12 and 24 months, sorted by geographic area



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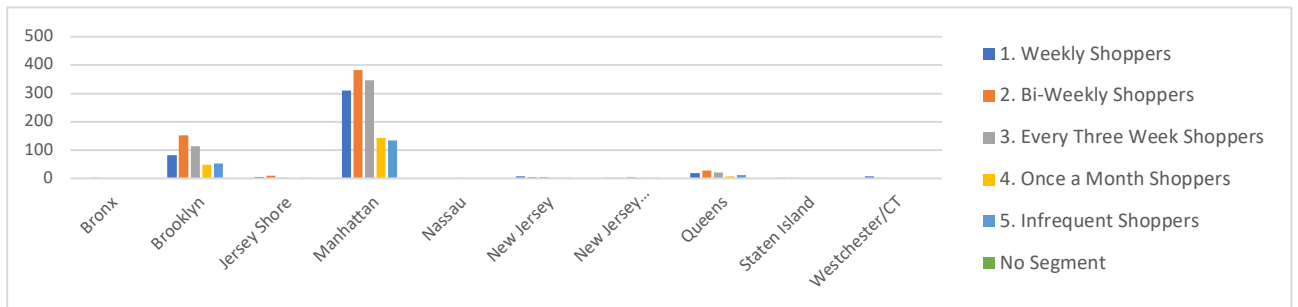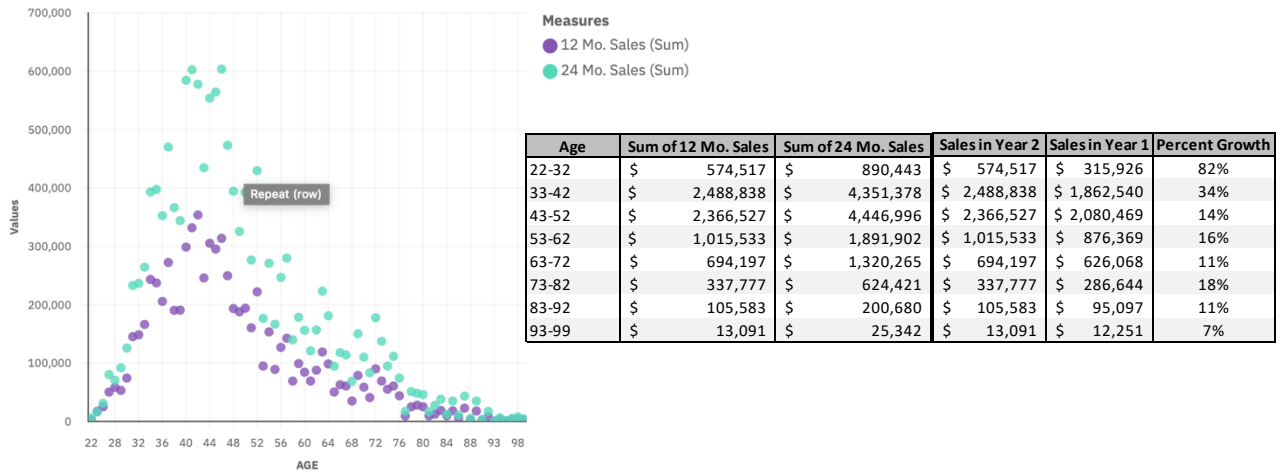


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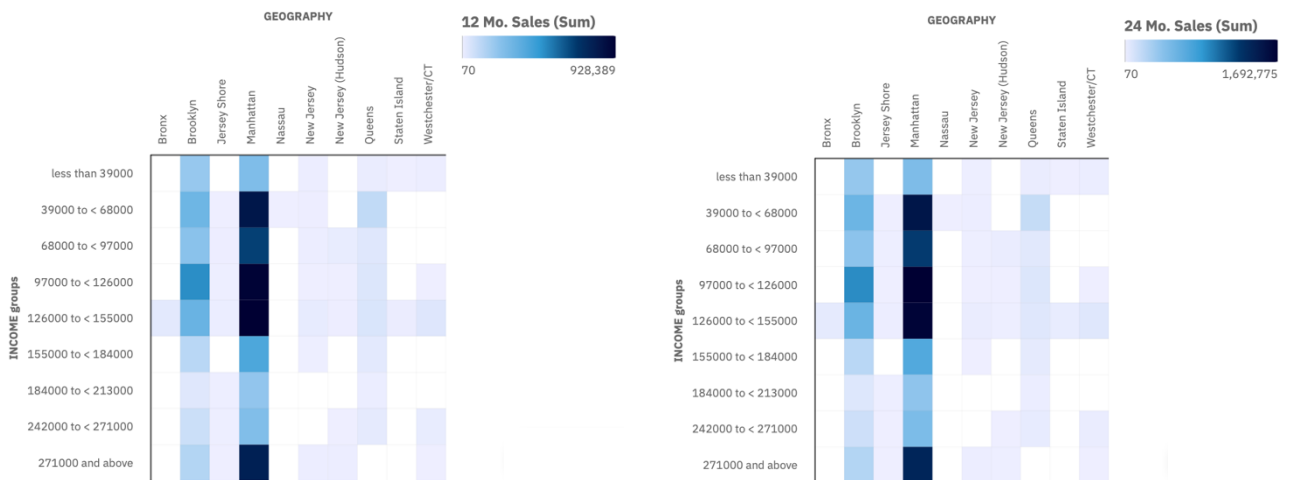


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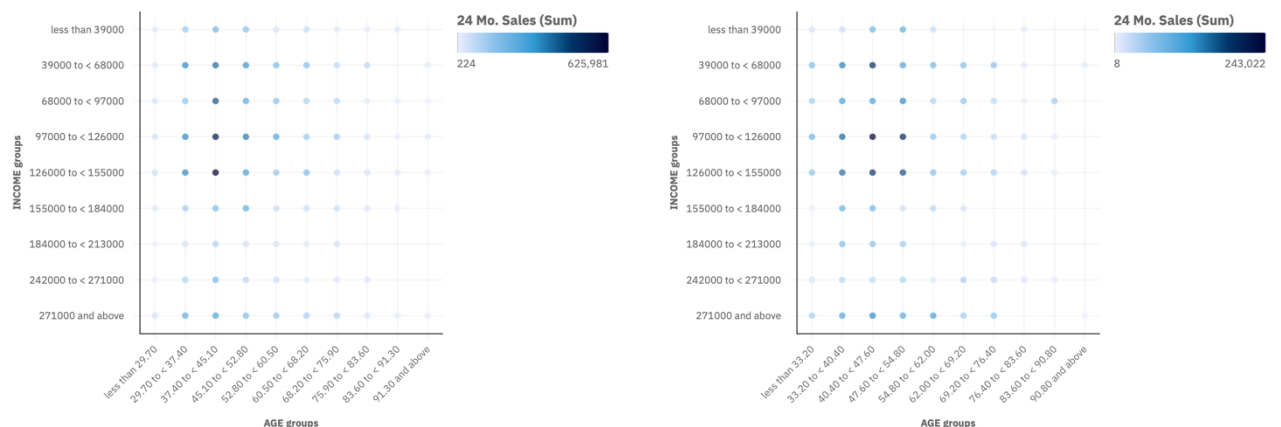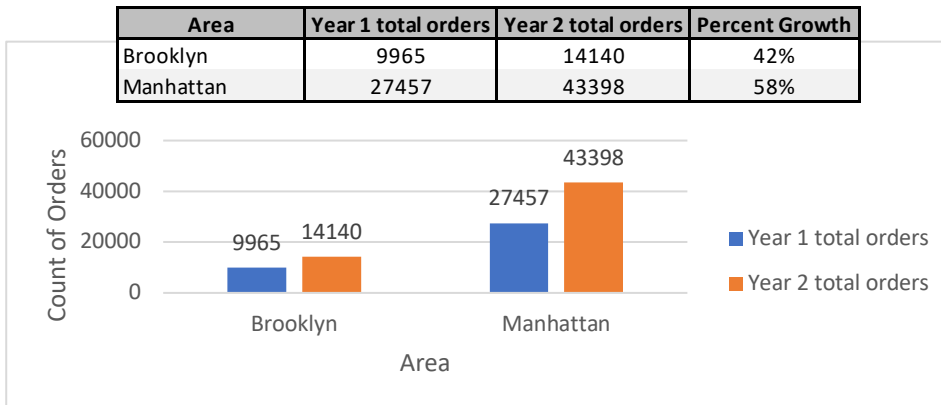
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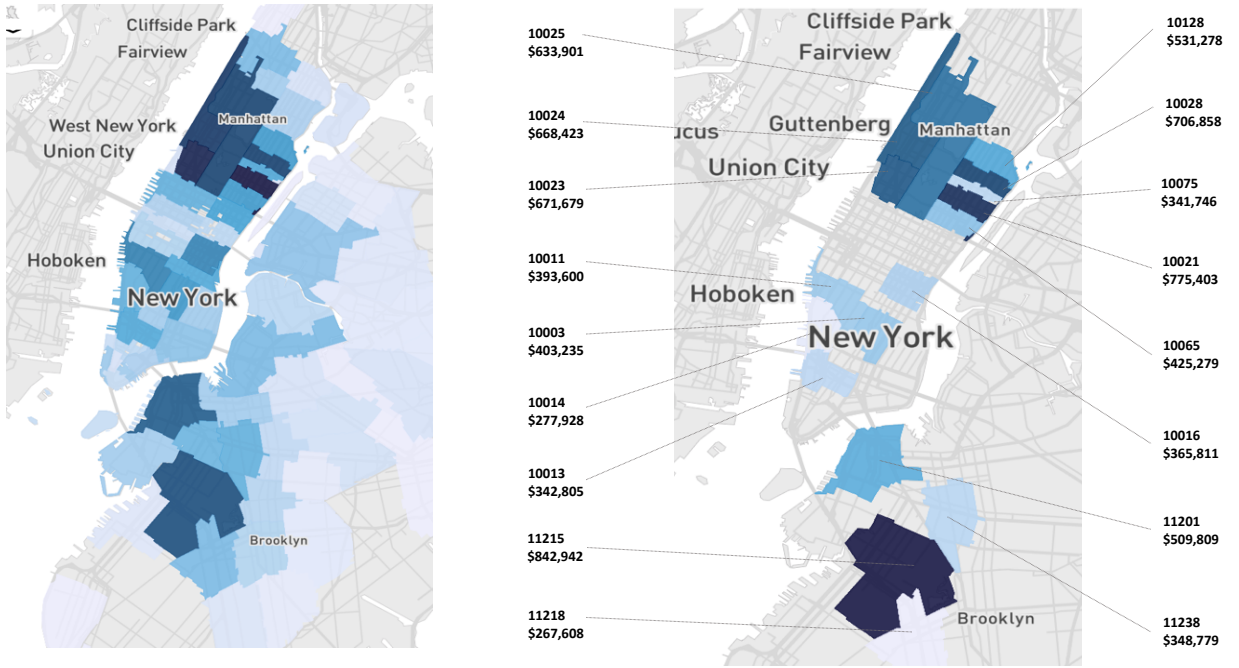
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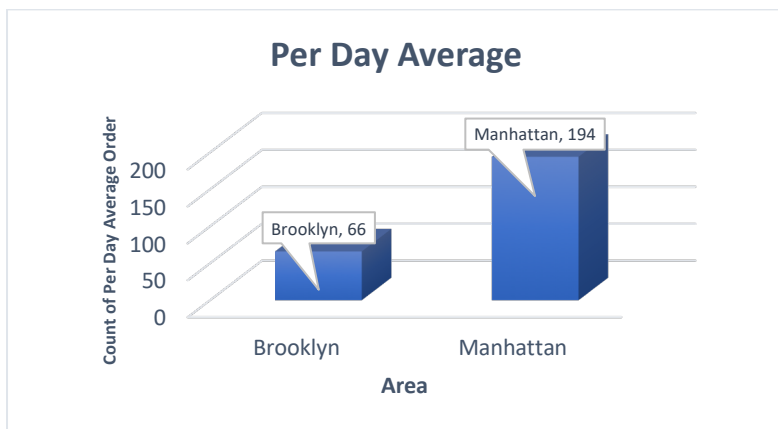


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